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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Peter Bixby, John Forecast,
William O. Hultin, Sorin Faibish,
Wayne W. Duso

Group Art Unit: 2614

Examiner: Unknown

Serial No.: 09/834,427
Confim. No. 5914

Atty. Dkt. No.: 10830.0071.NPUS00

Filed: April 13, 2001

For: MPEG DUAL-CHANNEL DECODER
DATA AND CONTROL PROTOCOLS
FOR REAL-TIME VIDEO STREAMING

SUBMISSION OF FORMAL DRAWINGS

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Commissioner for Patents
Washington, D.C. 20231

Sir:

Applicants hereby submit the formal drawings (21 sheets) for the above-referenced application and request that these drawings be accepted for filing.

Respectfully submitted,

Richard C. Auchterlonie

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TRANSMITTAL FORM <small>(to be used for all correspondence after initial filing)</small>	Application Number	09/834,427	
	Filing Date	April 13, 2001	
	First Named Inventor	Peter Bixby	
	Group Art Unit	2614	
	Examiner Name	Unknown	
Total Number of Pages in This Submission	23	Attorney Docket Number	10830.0071.NPUS00

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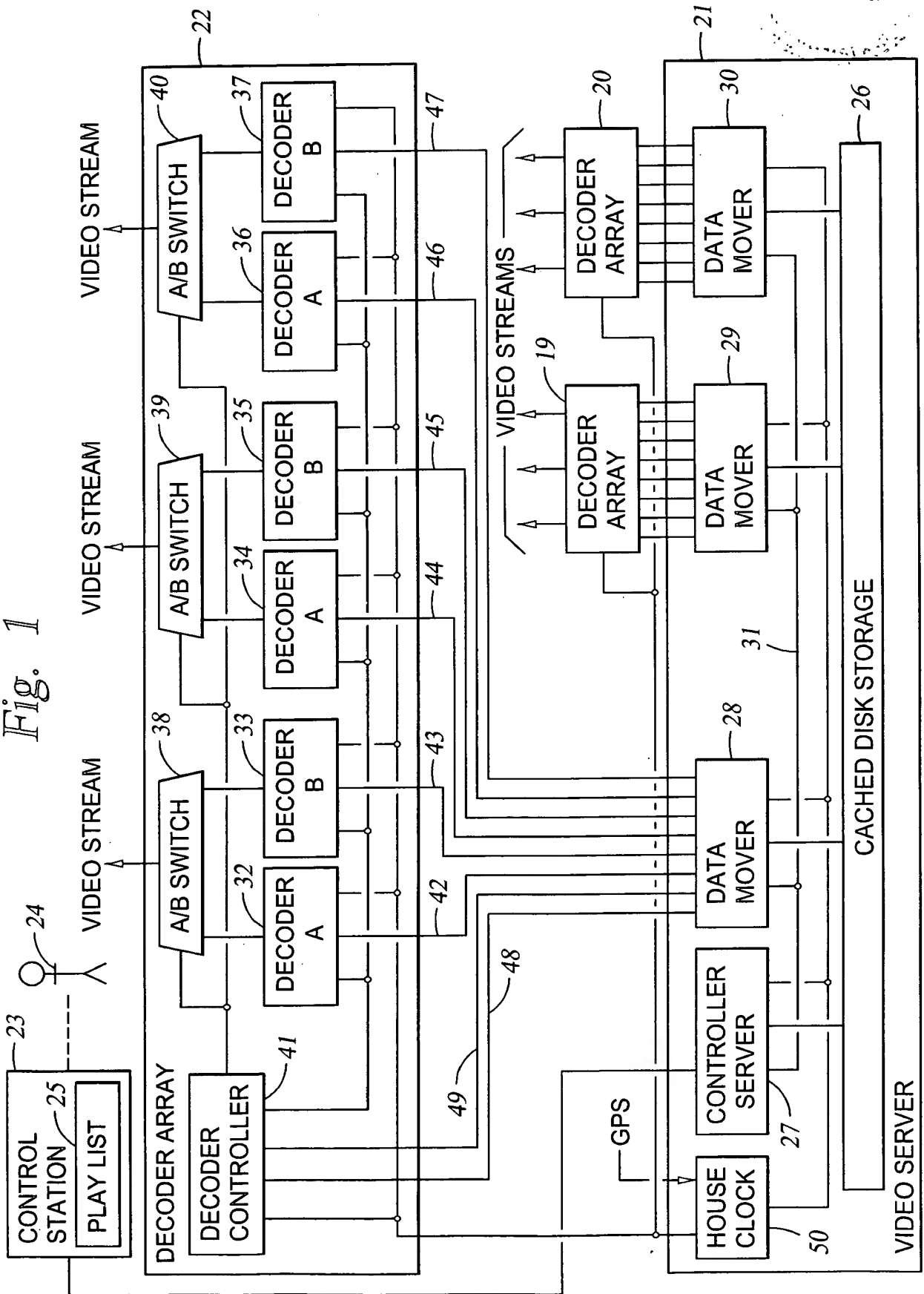
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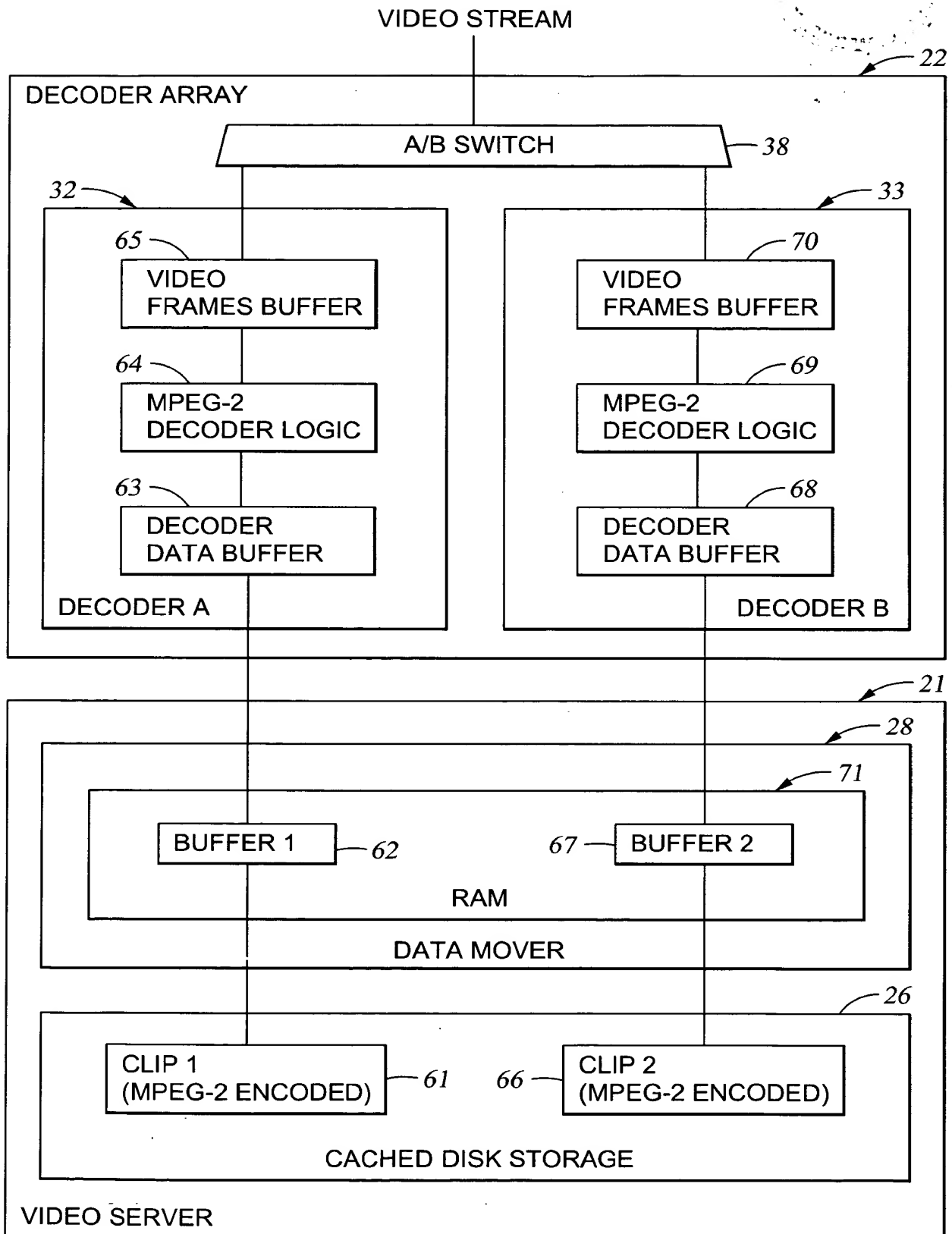
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Fig. 1



*Fig. 2*

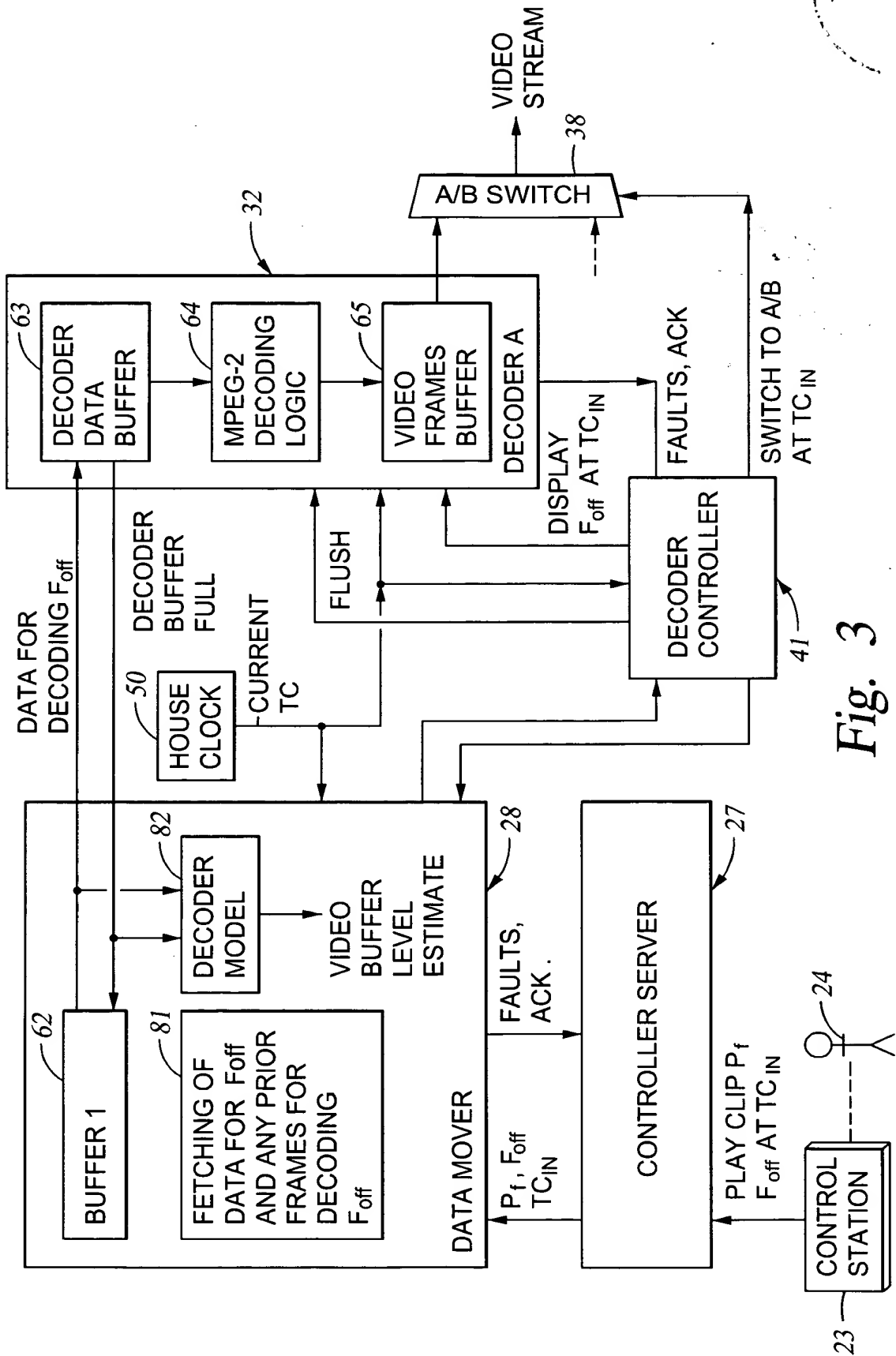


Fig. 3

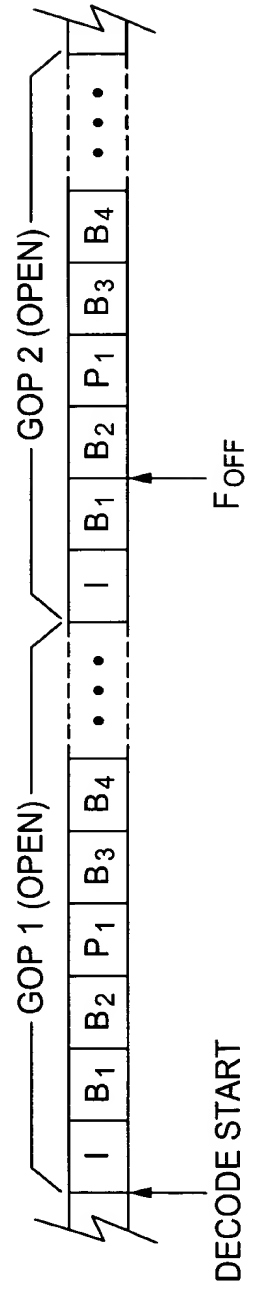
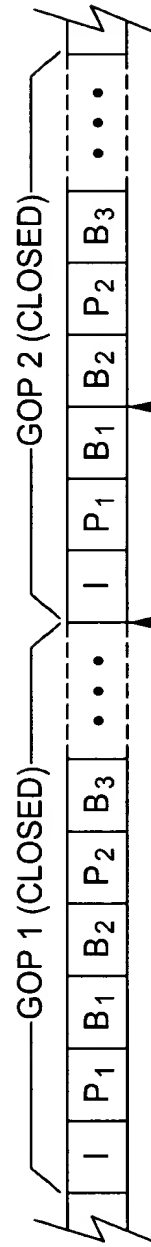
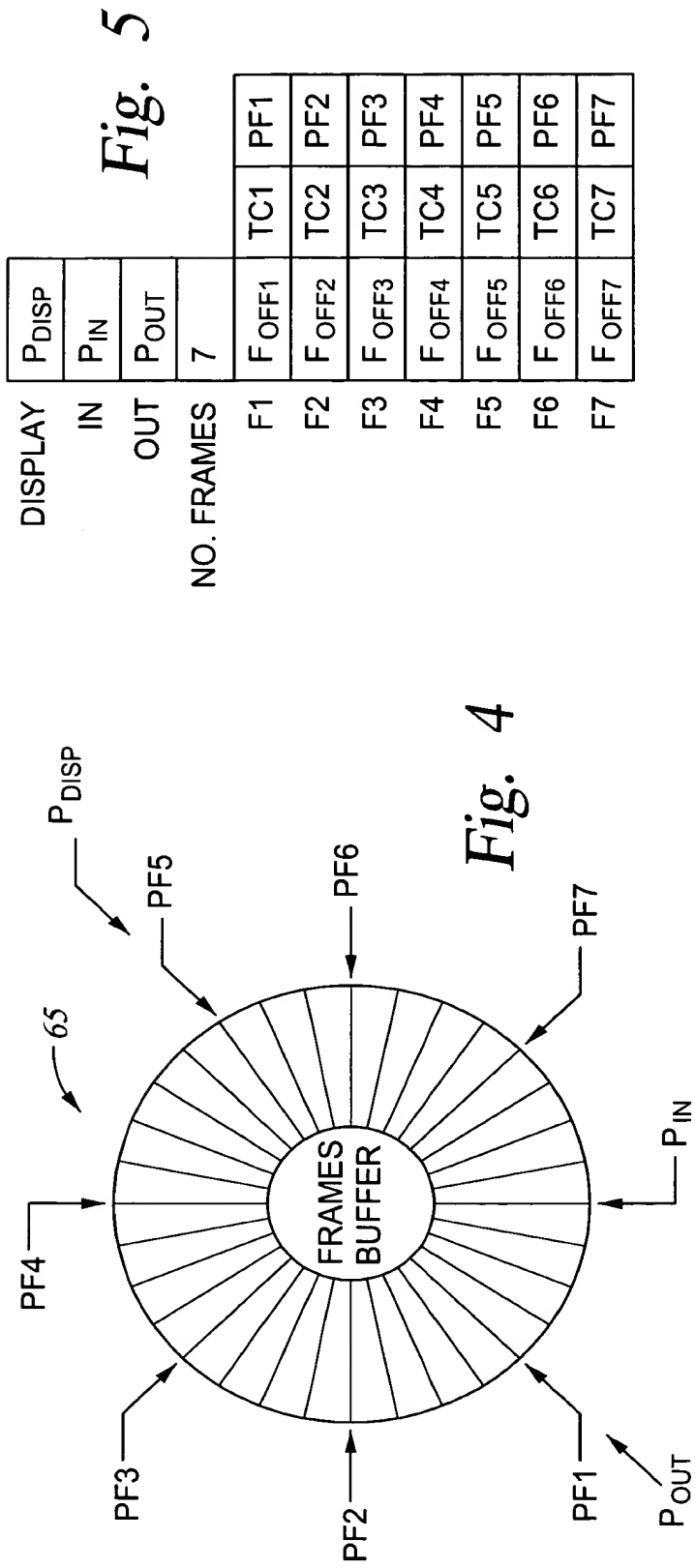
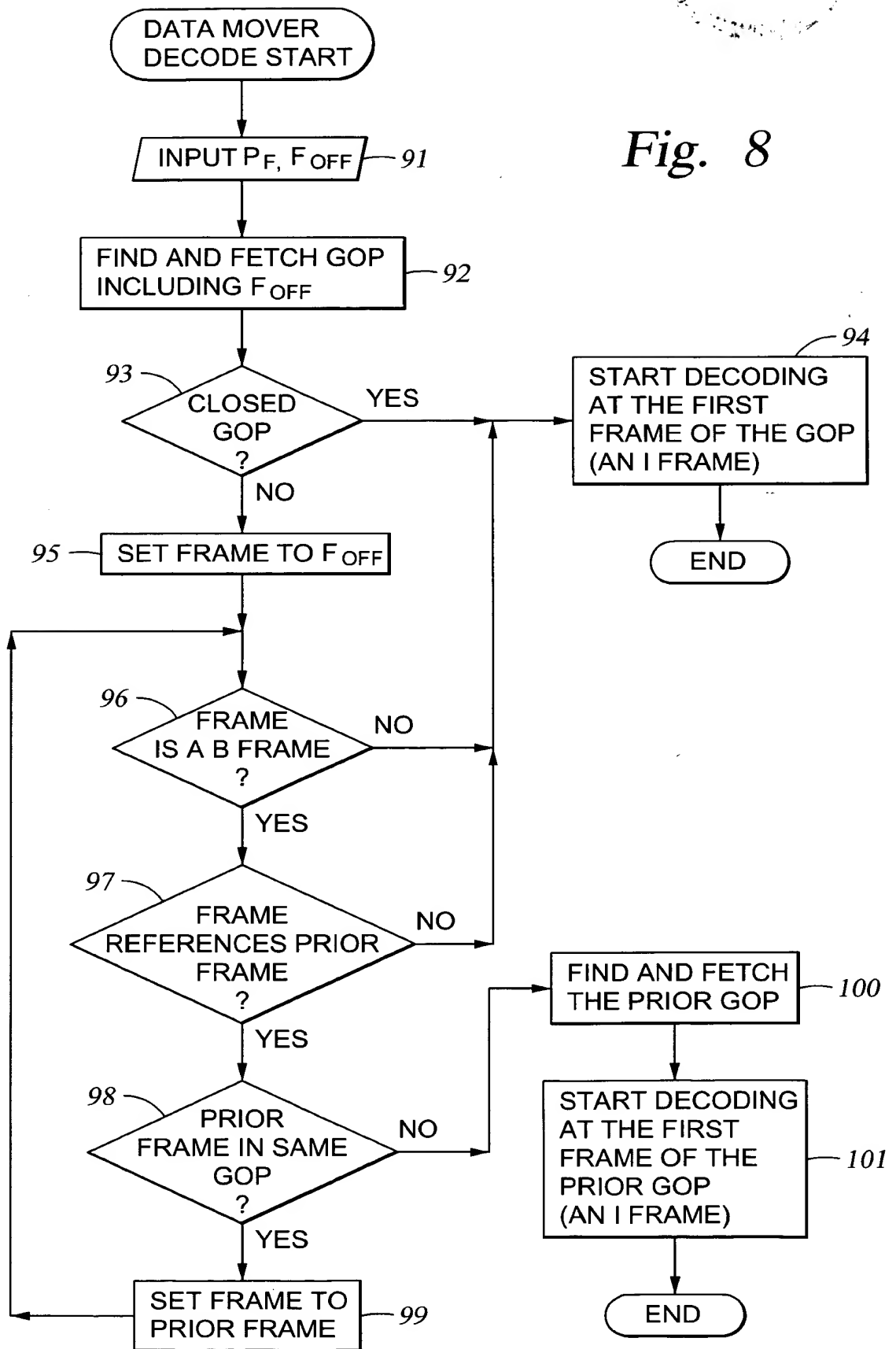


Fig. 8



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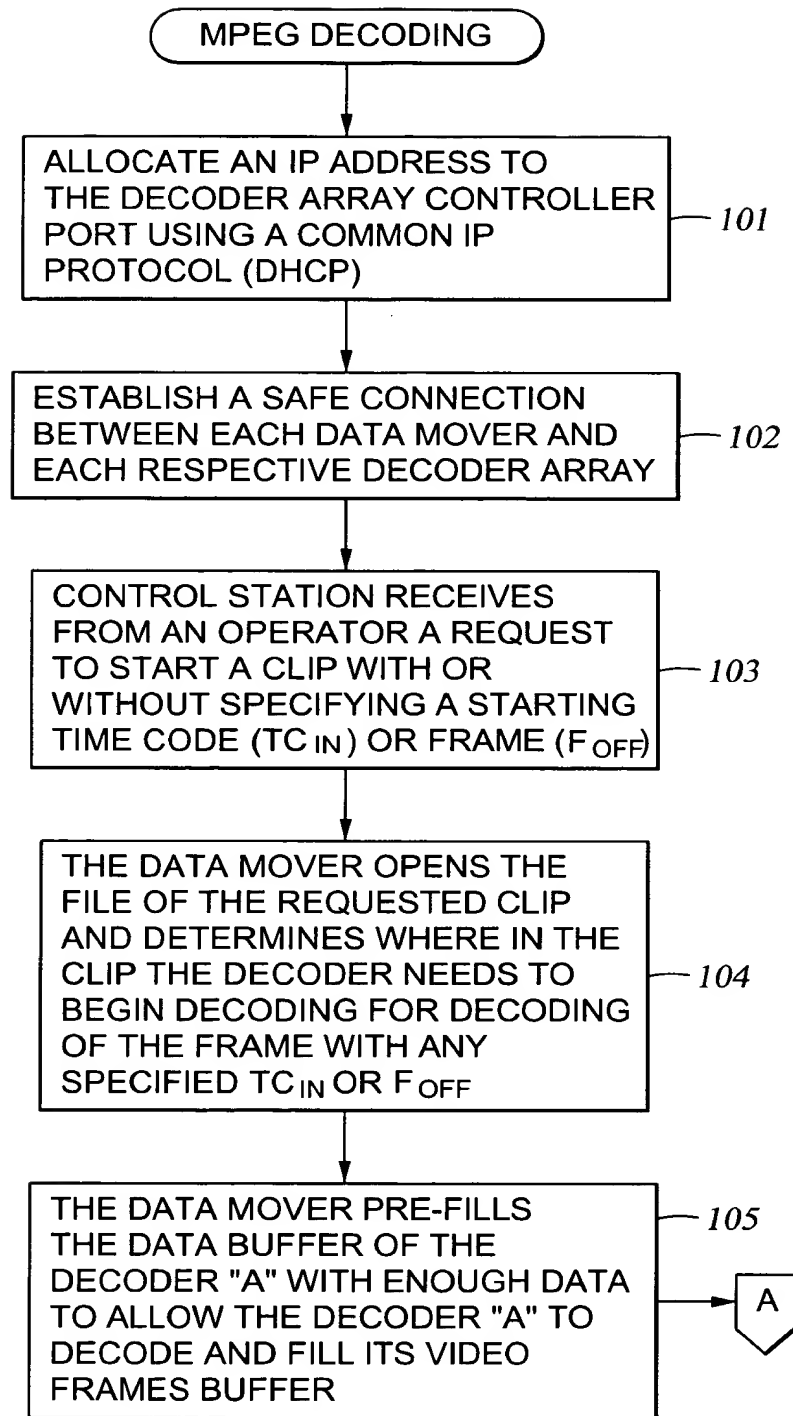
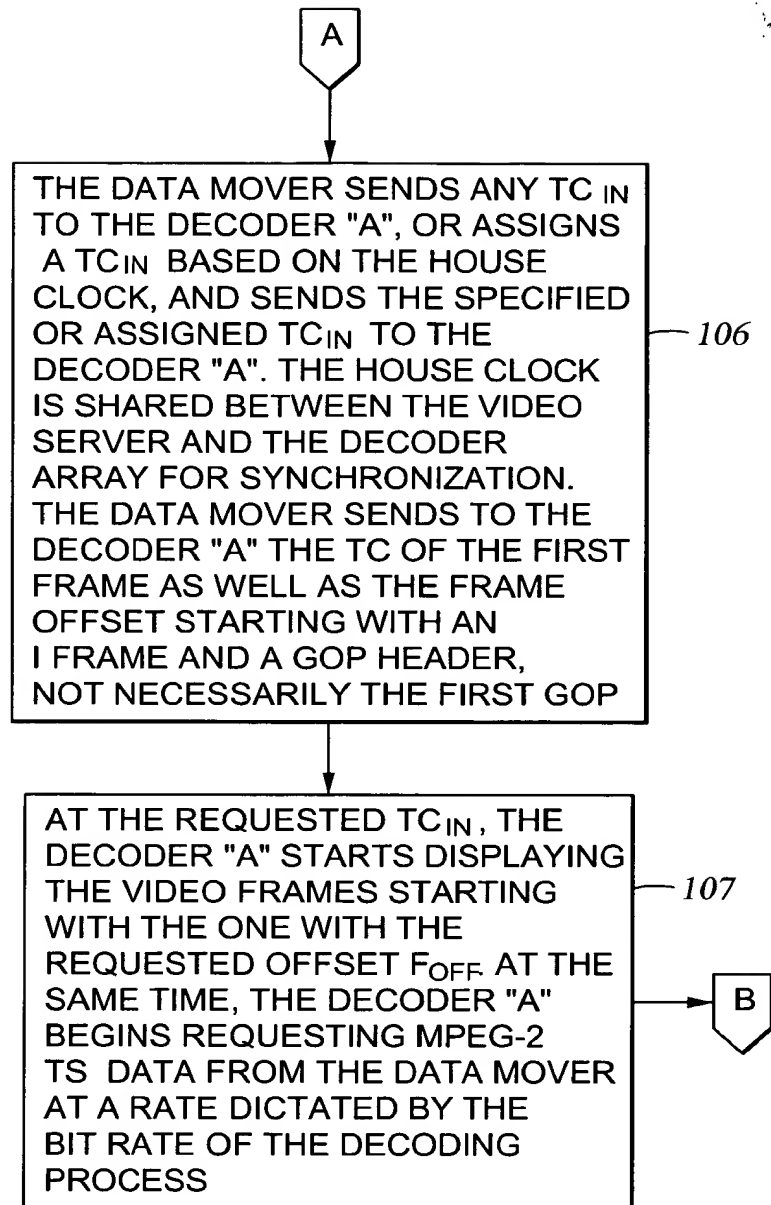
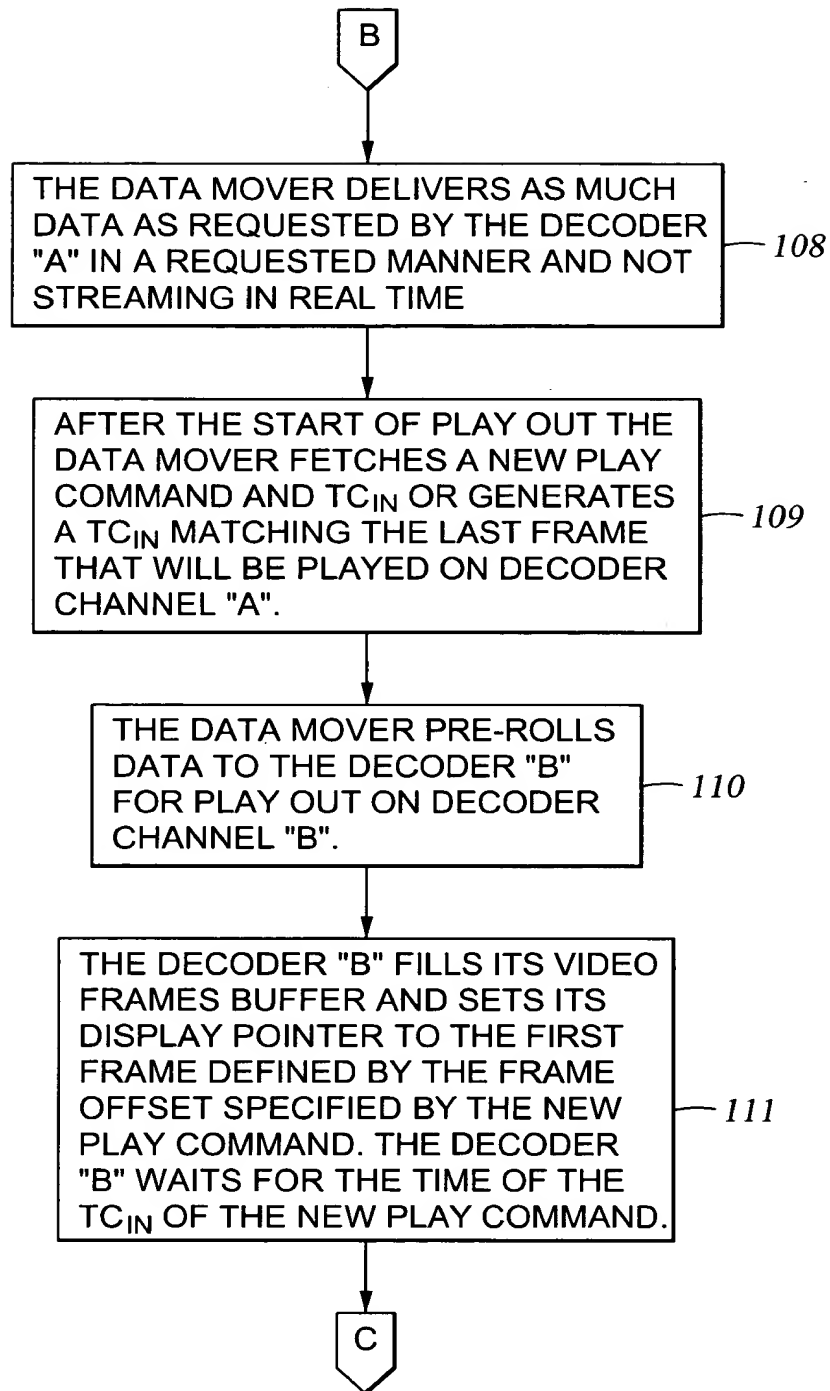
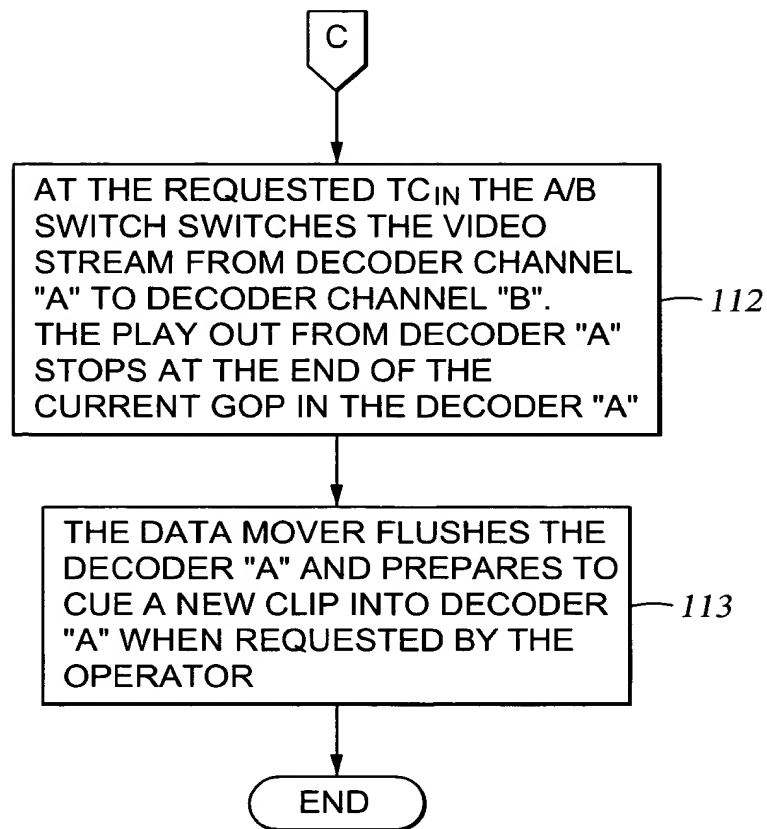
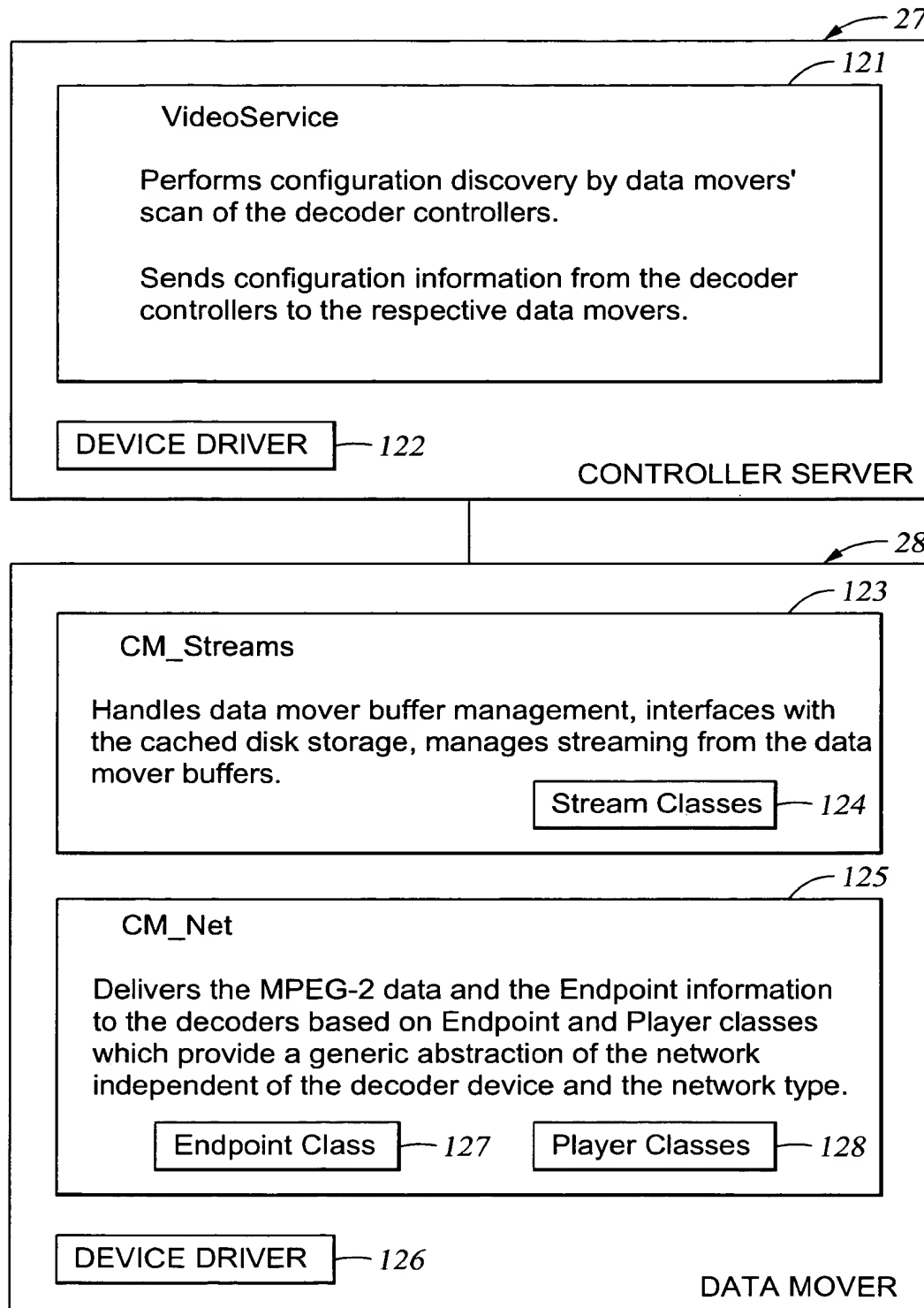


Fig. 9

*Fig. 10*

*Fig. 11*

*Fig. 12*

*Fig. 13*

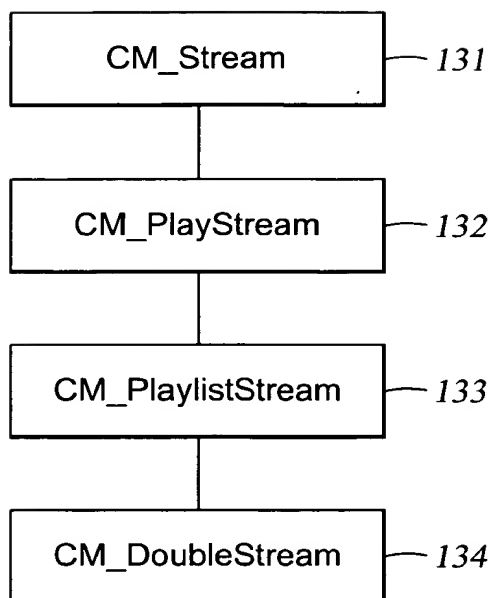


Fig. 14

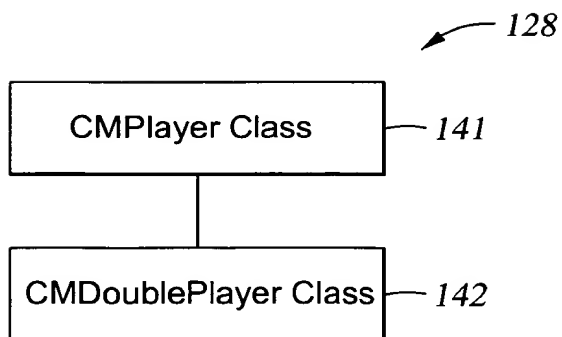


Fig. 15

Control Protocol

<p><u>Configuration.</u> Allows the data mover to determine the configuration of the decoder array and set up any configuration parameters. Commands: QueryStatus, Configure</p>
<p><u>Streaming.</u> Controls delivery of streams (i.e., timing, clips, transition type). Commands: PrerollClip, ModifyDisplayTime, CancelClipPreroll, PauseClip, ResumeClip, ModifyClip.</p>
<p><u>Asynchronous status reports.</u> Asynchronous reports of significant events from the decoder array to the data mover. Commands: ClipHasStarted, ClipHasEnded, ClipsEnding, TrapMessage, EditSummary.</p>
<p><u>Edit.</u> Allows all decoders in the decoder array to be controlled by an edit review station. Commands: Jog forward/backward, Shuttle forward/backward, Stop, Goto a specific timecode, and normal Play.</p>

Fig. 16



Format of Streaming Protocol Ethernet Packet

Ethernet Header	(14 bytes)
IP Header	(20 bytes, min) (60 bytes, max)
UDP Header	(8 bytes)
Streaming Protocol Header	(32 bytes)
Optional Data	(6-26 bytes, min, depending on IP hdr) (1400-1440 bytes, max, depending on IP hdr)
Frame Checksum	(4 bytes)

Fig. 17

Request Message Header Format

Request message number		
Clip ID Number		
Sequence Number		
byte offset		
window size		
state	Reserved	speed
RESERVED		
RESERVED		

Fig. 18

Data Message Header Format

Data message number		
Clip ID Number		
Sequence Number		
offset		
0x00	0x00	data length
flags	RESERVED	
RESERVED		
RESERVED		

Fig. 19

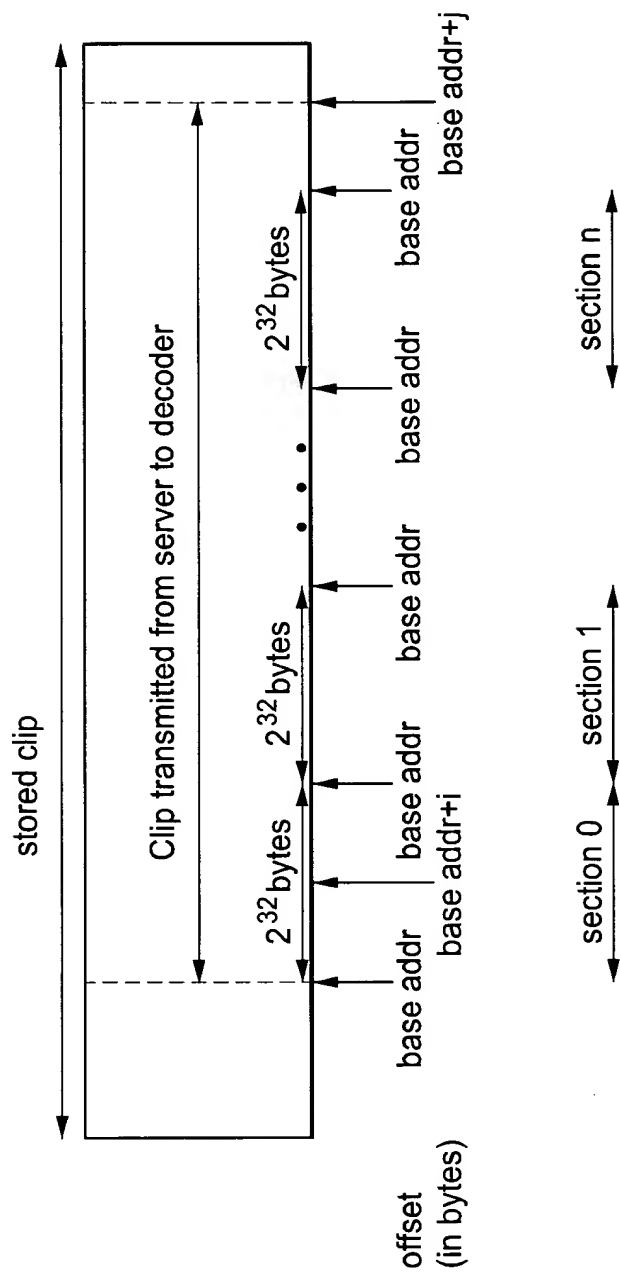
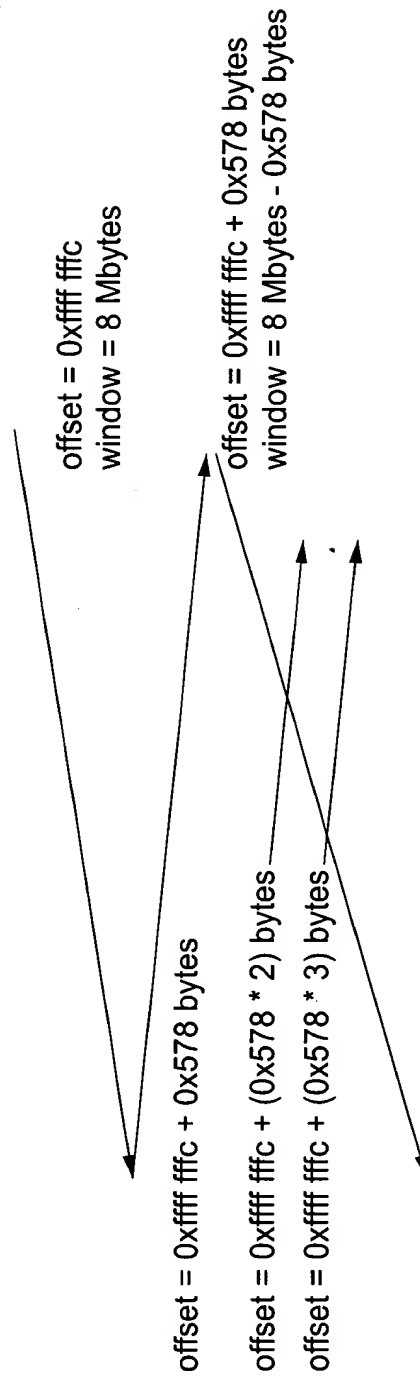


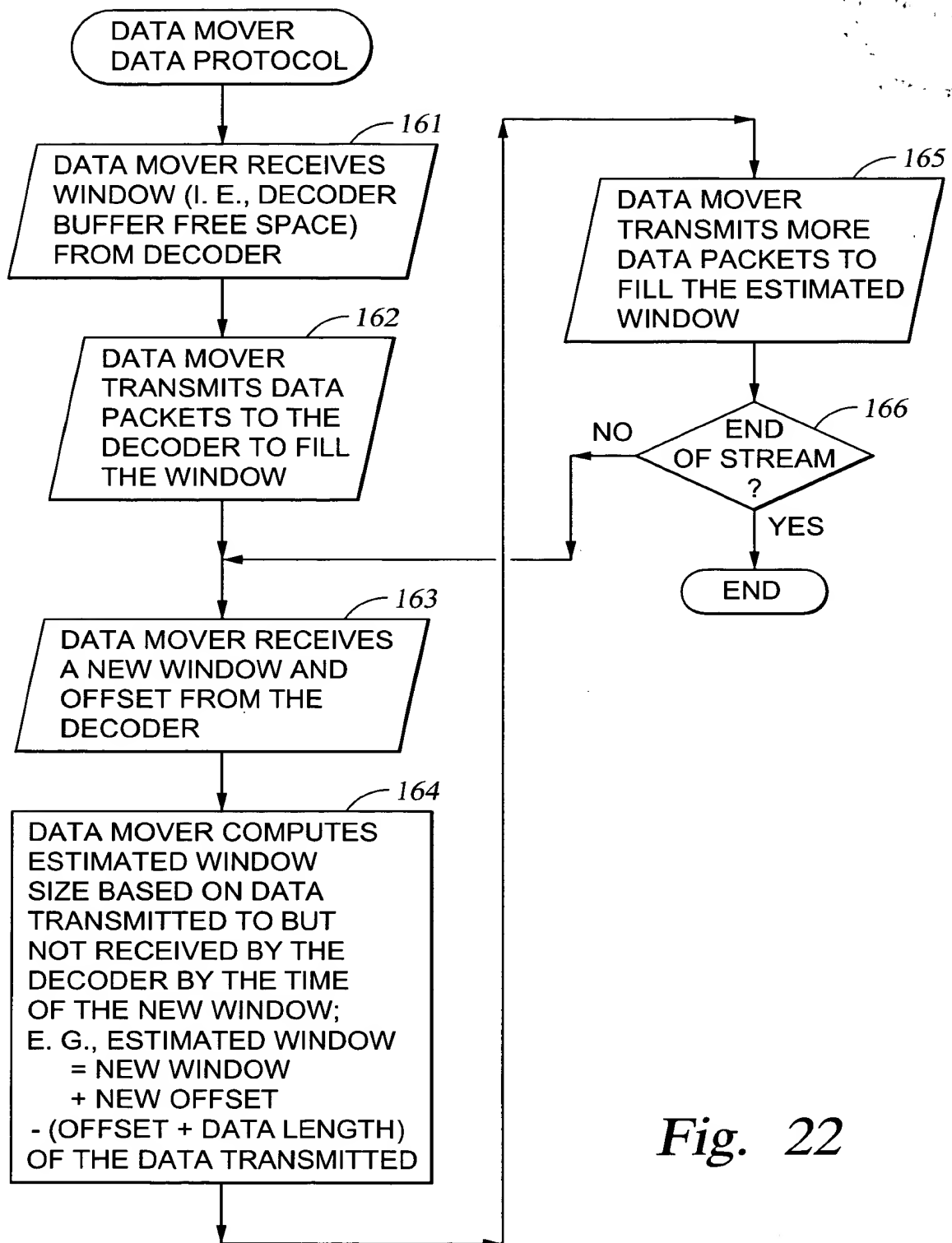
Fig. 20

DATA MOVER SETS OFFSET IN DATA MESSAGE DECODER SETS OFFSET IN RECEIVE MESSAGE



Data mover knows that real window size is not 8 Mbytes - 0x578 bytes since two more data messages are in transit with 0x578 bytes each. Data mover calculates true window size

Fig. 21

*Fig. 22*

DATA MOVER SETS OFFSET IN DATA MESSAGE DECODER SETS OFFSET IN RECEIVE MESSAGE

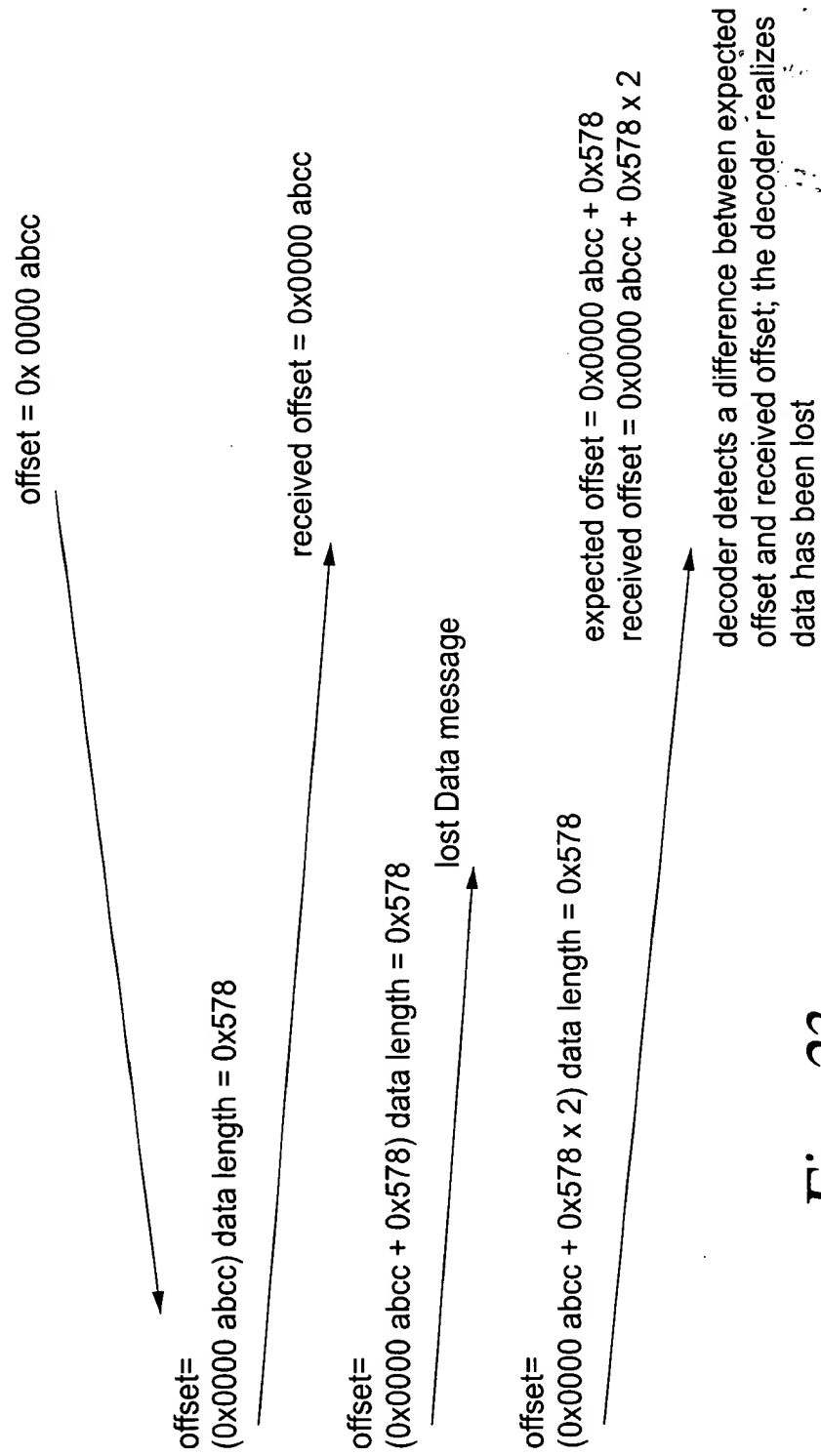
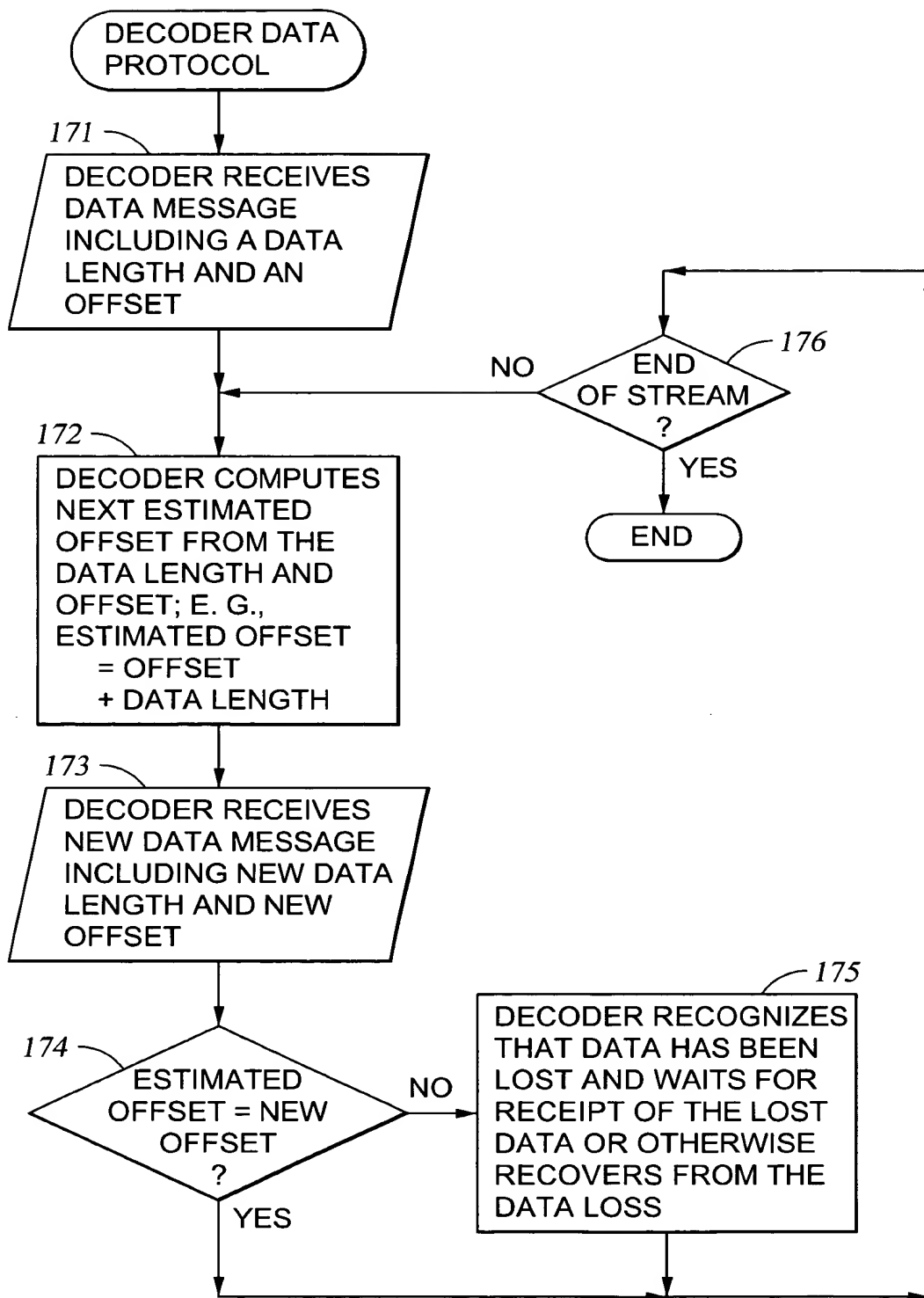


Fig. 23

*Fig. 24*

Definition of Streaming States

Streaming State	Definition
Cueing	Data mover sends data to the decoder, at least up to the time code that must be displayed. The data rate can be at a rate convenient for the data mover. The decoder consumes the data at 1 x real time. It is not important if the decoder underflows, since the underflow would be before the display time.
Streaming	The data mover sends data to the decoder at 1 x real time and the decoder consumes the data at 1 x real time; the decoder can underflow/overflow and it will affect the picture presented to the viewer.
Stopped	The decoder is not consuming data. During this state, the decoder continues to send Request messages at the configured Request interval.
non-overlapped	This state requires that the decoder send a new Request message only after receiving a response from the previous Request message. The data mover may use this mode for testing.

Fig. 25

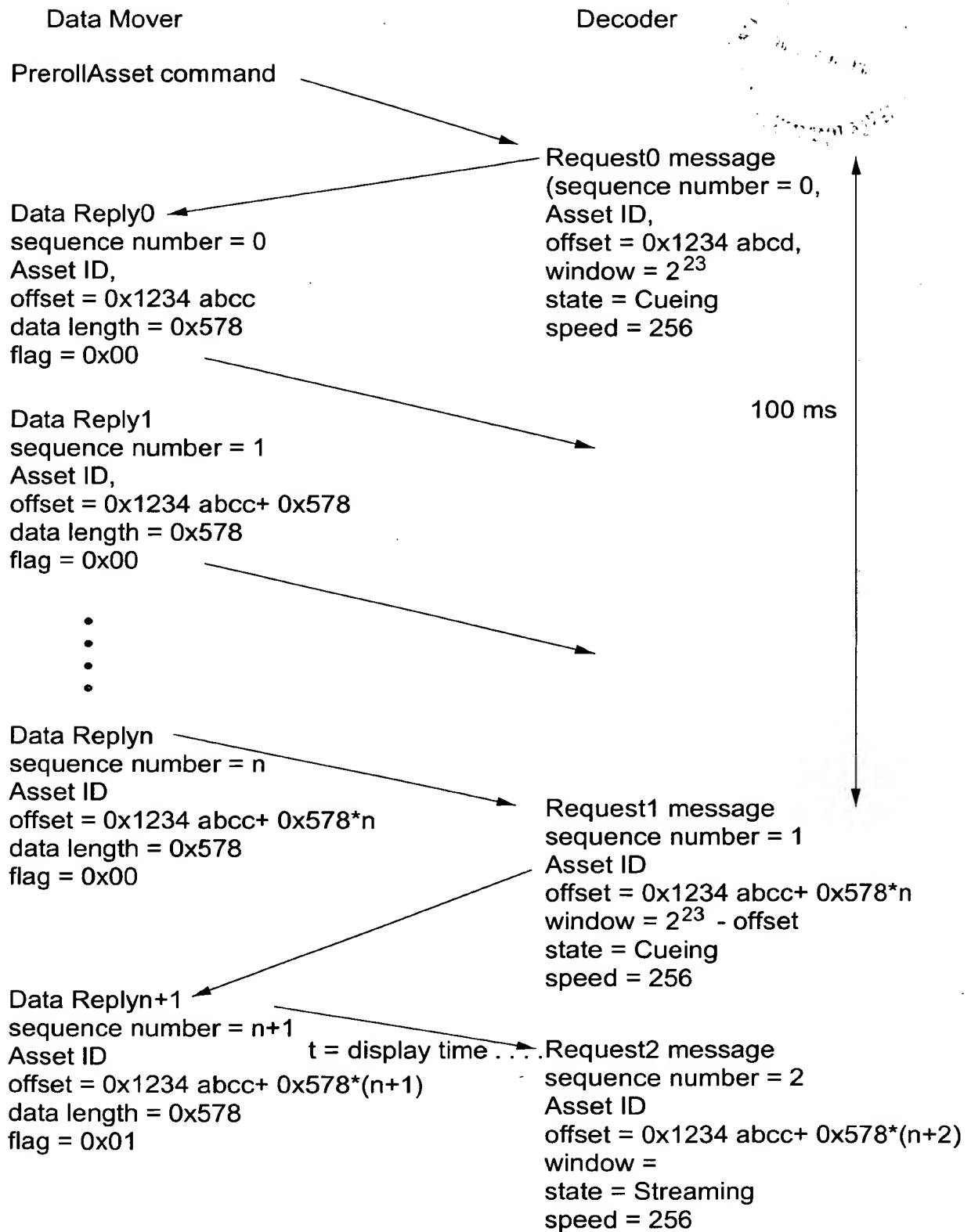


Fig. 26